



Case Study

EFFICACY OF VASAKADI KALPA IN HYPERTENSIVE RETINOPATHY (HR) INDUCED CYSTOID MACULAR EDEMA (CME)

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ABSTRACT

Cystoid Macular Edema (CME) often seen as a complication of many retinal and/or ocular pathologies. Hypertensive Retinopathy (HR) is one of them, occur as a target organ damage due to hypertension. Both leading to profound impairment of vision, affecting person's life. Currently available treatment of HR is insufficient and unsatisfactory as it is only limited upto use of anti-hypertensive drugs to precisely control the blood pressure and use of antioxidants to relieve oxidative stress Hence there is need of more satisfactory treatment. Prevalence of HR will rise from 29.9% with increasing prevalence of hypertension. *Vasakadi Kalpa*, drug used in this trial shows mild anti-hypertensive, antioxidant and anti-lipidemic effects. Thus, this poly-herbal formulation relives edema and haemorrhages associated with HR. It also affects associated vascular changes leading to decrease in CME induced by HR.

INTRODUCTION

Hypertensive Retinopathy (HR) is a Vascular Retinopathy^[1] which occurs as a Target Organ Damage (T.O.D.) or complication of systemic condition Hypertension (HTN) characterized by raised systolic and diastolic Blood Pressure (BP)^[2]. It is associated with progressive micro- and macro-vascular changes along with hypoxia or anoxia of related retina. It reflects vascular status of other vital organs like heart, kidney and brain. It is characterized by vaso-constriction, attenuation, haemorrhages and exudates impairing vision of subject profoundly. HR may be associated with inflammatory conditions like papillo edema, maculopathy and Cystoid Macular Edema [CME] leading to blurring of vision due to multiple cystoid areas in sensory retina.

The only available treatment of HR is controlling systolic and diastolic BP by using proper anti-hypertensive drugs, which is insufficient and unsatisfactory to affect vascular changes associated with HR.

Use of anti-oxidants^[3] also play important role in treatment of HR, by mild anti-hypertensive action along with decreasing oxidative stress. Still there is need of efficient and easily assessable drug, free from adverse effects and drug interactions especially from alternative ancient schools of medicines like Ayurveda, as prevalence of HTN will rise to 29% by 2025^[4] and along with it prevalence of HR will also increase from current rate of 29.9%.^[5]

While treating HR, even if according to Ayurvedic modalities, it is important to consider root cause that is HTN first. Hence treatment should be *Tridosahara*, *Medo-avarana nashak*, *Rakta-Marga Vishodhaka* and *Rasa-Rakta Prasadaka*. Drug used for this study *Vasakadi Kalpa*, mentioned in *Chakradatta*, assumed to restore diminished vision by reducing haemorrhages, exudates i.e., *Kapha* related conditions and arteriosclerotic changes reflecting *Rasa-Raktavaha Strotas Vikrutti*^[6]. This drug also shows anti-oxidant, anti-lipidemic as well as additive anti-hypertensive effects^[7-13] and hence used in treatment of HR.

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Case History

Name of Pt.	X.Y.Z.		
Age	65 yrs		
Sex	Male		
Residence	Worli, Mumbai		
Occupation	Retired Teacher		
C/O	D.O.V. for near & distance since 1 month Blurring of vision since 1 month Bilateral, gradual Rt. eye >Lf. eye		
P/H	HTN since 3 yrs On Rx Tab. Amlodepin 5 mg OD No H/O DM / BA / KOCHS / operative history / surgical illness		
Presenting Concern	A 65 years old male patient came to the hospital with history of HTN		
Since 3 years on regular Rx taking Tab. Amlodepin 5mg once a day. He was c/o gradual loss of bilateral visual acuity since 1 month along with blurring of vision. After local examination of eyes and assessment of visual acuity for near and distance he was advised for fundoscopy. On fundoscopic examination vascular attenuation and AV nicking along with chorio-retinal degeneration, old haemorrhages and left sided CME. Hence patient was advised for OCT and further investigations.			
General Examination	General condition of patient was good with normal vitals and <i>Ashtavidha</i> .		
<i>Parikshana</i> like <i>Mala</i> , <i>Mutra</i> etc. and <i>Prakriti</i> of patient was <i>Pitta-Kapha</i> .			
Ocular Examination	Local Examination Bilateral extra-ocular findings & ocular findings were normal with normal IOP (Rt.:14.6 & Lf.:17.3 mm of Hg) Visual acuity: Rt.: Finger Counting 1 feet N-24 Lf.: 6/24 (Snellen's) N-12		
	Ophthalmoscopic examination after mydriasis Lens: Rt.: Cortico-nuclear changes Grade III Lf.: Cortico-nuclear changes Grade II Vitreous: Rt.: Degeneration Lf.: Degeneration Fundus: Bilateral AV Nicking, Attenuation & Chorio-retinal Degeneration with maculopathy Fundal Photographs		
Investigations	CBC	Hb RBC WBC	13.2 gm/dL 4.77×10 ⁶ /μL 8.99×10 ³ /μL
	ESR	9mm/ hr	
	Urine	Protein	Absent
	OCT (21-05-2018) Left sided thin epiretinal membrane with no traction over fovea. Left sided minimal cystoid macular edema. Right sided thinning of retinal pigment epithelium and retina due to myopia. No evidence of cystoid changes or sub-retinal fluid on right.		

Case Conception & Selection of Treatment

Patient was diagnosed for left eye CME after OCT. Main etiological factors (*Nidana*) concerned in this case are physiological factors like spicy-oily food, increased glucose and fat intake and relatively sedentary lifestyle along with psychological factors like anger, tension and worry. This leads to *Rasa-Rakta* *gata Sneha Dushti* along with *Pitta* assimilated *Rakta Vriddhi* vitiating *Raktavaha Strotas-dhamani* that is vascular structure circulating blood. These vascular changes lead to disturbed vascular permeability characterized by hemorrhages, exudates and edema.

While treating HR induced CME, we have to consider root cause HTN first. Drug used for treatment should have anti-hypertensive properties along with antioxidant nature to reduce oxidative damage. *Vasakadi Kalpa* shows above properties with anti-haemorrhagic and anti-oedematous nature and finally improves visual acuity. Hence in this case, *Vasakadi Kalpa* given as a *Kwath* in dosage 30ml twice a day orally for about 6 months which contains:

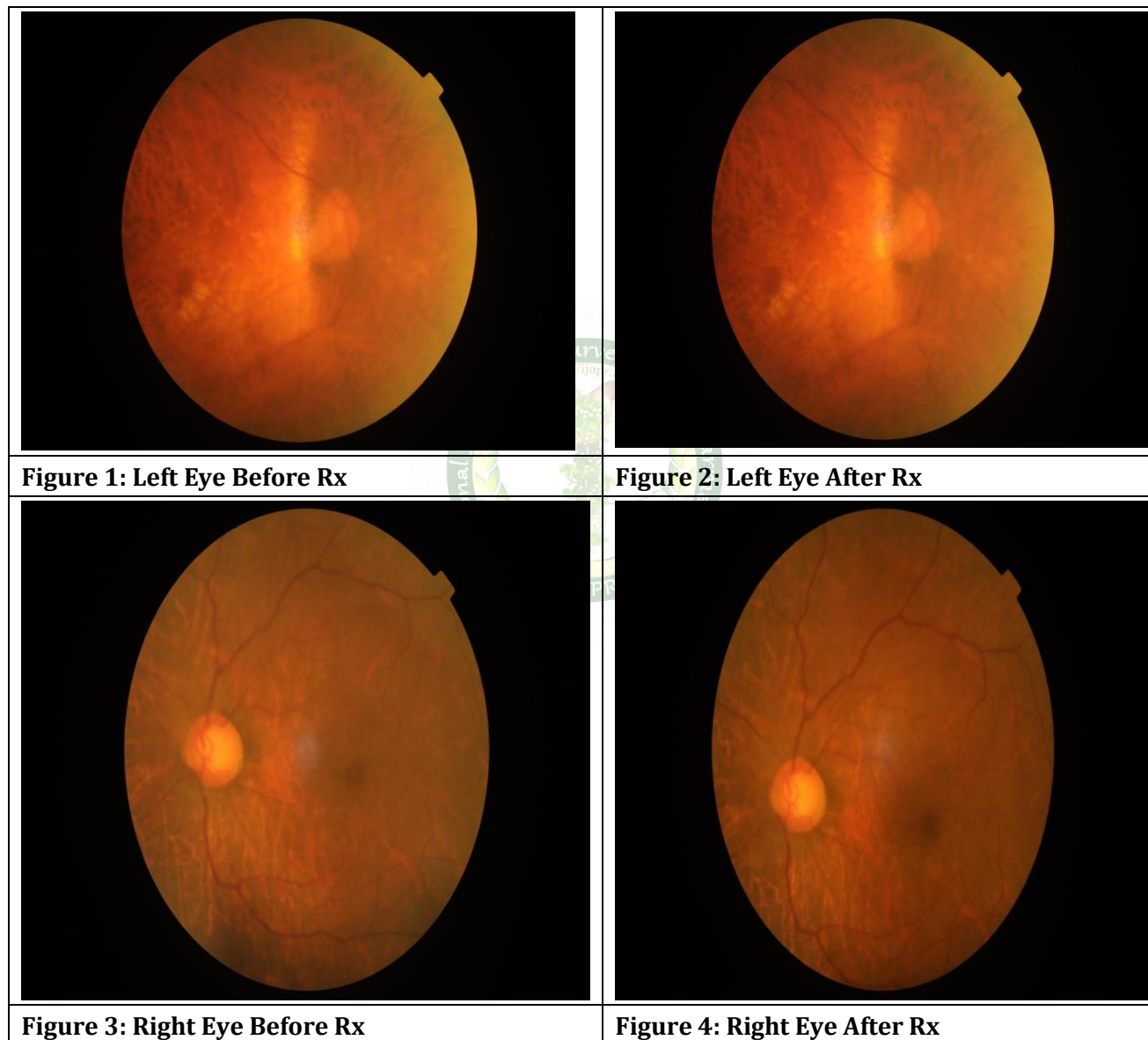
Table 1: Contents of <i>Vasakadi Kalpa</i>		
Drug Name	Latin Name	Part Used
<i>Vasa</i> ^[7]	<i>Adhatoda vasica</i> Nees.	<i>Moola</i>
<i>Abhaya</i> ^[8]	<i>Terminalia chebula</i> Retz.	<i>Phala</i>
<i>Nimba</i> ^[9]	<i>Azadirachta indica</i> A.Juss	<i>Patra</i>
<i>Dhatrī</i> ^[10]	<i>Emblica officinalis</i> Gaertn.	<i>Phala</i>
<i>Musta</i> ^[11]	<i>Cyperus rotundus</i> Linn.	<i>Kanda</i>
<i>Aksha</i> ^[12]	<i>Terminalia bellirica</i> Roxb.	<i>Phala</i>
<i>Kulak (Patol)</i> ^[13]	<i>Trichosanthes dioica</i> Roxb.	<i>Patra</i>

Kwatha is prepared as per the standard *Granthokta* procedure^[14] by taking all these *Dravyas* as a *Bharad* in equal quantities and adding 16 parts of water. When 1/8th part remained, after boiling it on low flame, *Kwath* is administrated orally in the dose 30 ml twice a day – before breakfast and before dinner.

Observation

Table 2: Observations before & after treatment		
Assessment Criteria	Before Rx (14-05-2018)	After Rx (17-12-2018)
Vision: Distance		
Right	Fc. 1 ft.	Fc. 3 ft.
Left	6 / 24	6 / 6 (P)
Vision: Near		
Right	N-24	N-36 (P)
Left	N-12	N-6 (P)
Pin Hole Vision		
Right	Fc. 1 ft.	Fc. 4 ft.
Left	6 / 24	6 / 6
IOP		
Right	14.6 mm of Hg	17.3 mm of Hg
Left	14.6 mm of Hg	17.3 mm of Hg
Blood Pressure	140 / 80 mm of Hg	130 / 70 mm of Hg
Bio-chemical Parameters;		
BSL: F	96 mg / dL	99 mg / dL
PP	146 mg / dL	125 mg / dL
RFT: Blood Urea	36 mg / dL	34 mg / dL
Sr. Creat.	1.5 mg / dL	1.2 mg / dL

Lipid Profile: Sr. HDL	46 mg / dL	59 mg / dL
Sr. LDL	146 mg / dL	135 mg / dL
Sr. VLDL	26 mg / dL	21 mg / dL
Sr. Cholesterol	233 mg / dL	216 mg / dL
Urine (Microscopy)		
Micro-albumin	93.0 mg / dL	10.2 mg / dL
Creat.	159.7 mg / DL	055.2 mg / dL
Micro-albumin Creat Ratio	58.2 µg / mg	18.40 µg / mg

Fundal Photographs & OCT Reports: (Original)(Figure 1-8)**FIGURES****Figure 1: Left Eye Before Rx****Figure 2: Left Eye After Rx****Figure 3: Right Eye Before Rx****Figure 4: Right Eye After Rx**

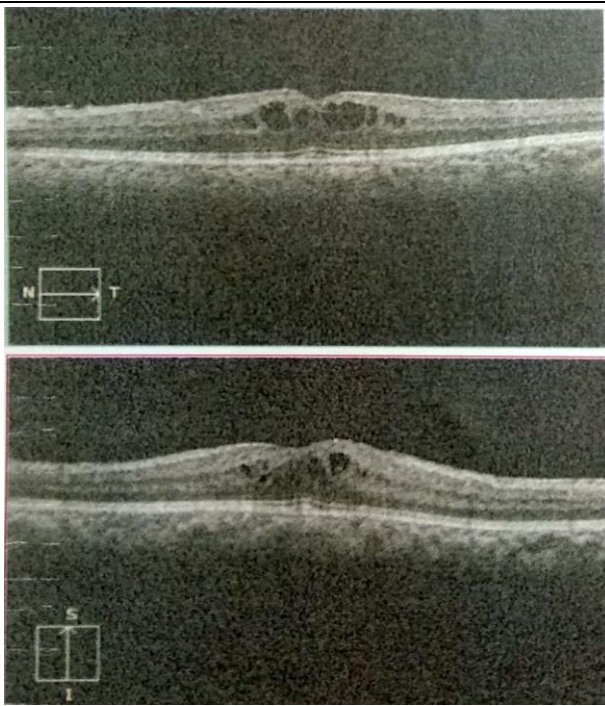


Figure 5: LE OCT Before Rx

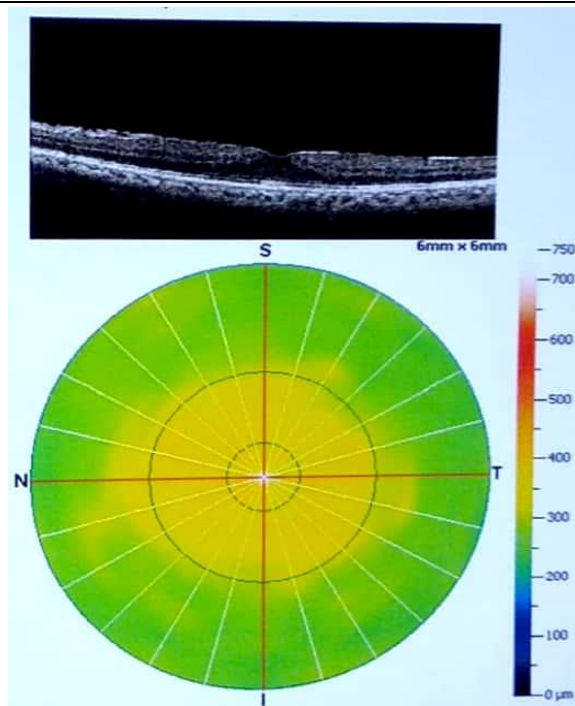


Figure 6: LE OCT After Rx

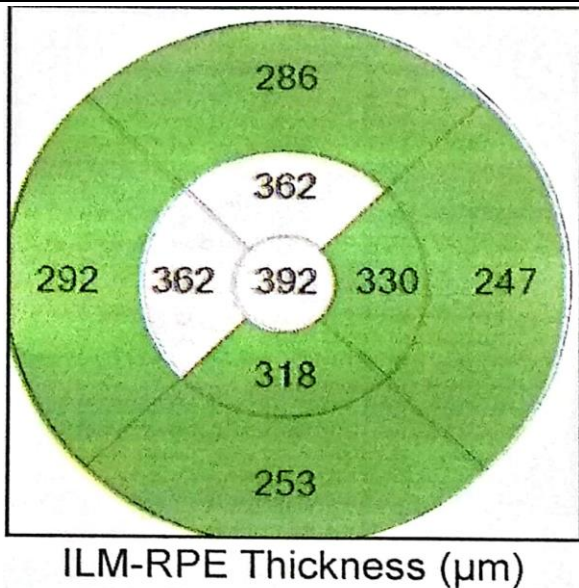


Figure 7: Left Macular Thickness Before Rx

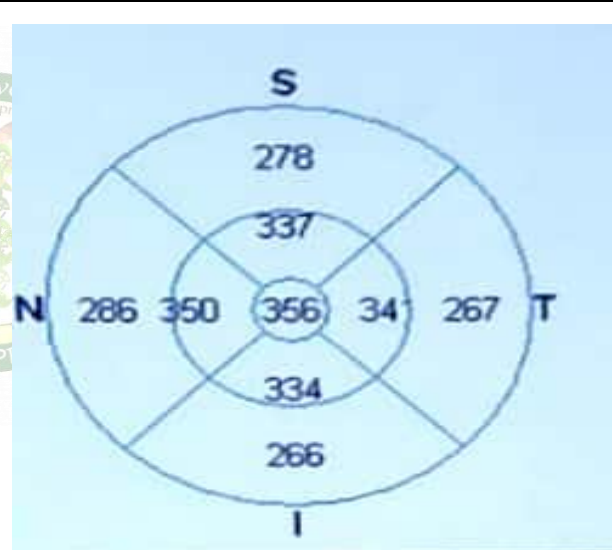


Figure 8: Left Macular Thickness After Rx

RESULT

Vasakadi kalpa is effective in treatment of CME along with regress in symptoms of HR. It can be justified as visual acuity of left eye was significantly increased even though there was little improvement in that of right eye due to progressively increasing lens changes. *Vasakadi Kalpa* even also shows significant reduction in excretion of micro-albumin in urine, which is a sign of the Hypertensive Glomerulopathy i.e. renal dysfunction as T.O.D. of HTN.^[15]

DISCUSSION

Patho-physiology (Probable *Samprapti*)

CME^[16] results from the accumulation of fluid, in cyst like cavities, in the outer plexiform and inner nuclear layers of the retina. It is caused as complication

of various local and systemic conditions. Here, in this case real culprit is HTN represented with T.O.D. hypertensive retinopathy. Pathogenesis of HTN^[17] (probable *Samprapti*) consists of combined or solitary effect of increased cardiac output and peripheral resistance.

In present case, when we seek back to aetiopathogenesis, increased intake of salty and spicy food ought to increase cardiac output. This also leads to *Pitta prakopa* and *Rakta dushti*, as vitiated *Pitta* assimilates and vitiates *Rakta* with its *Tikshna* and *Ushna guna*. Which further leads to *Dhatu swedana* that is excessive perfusion of water in vascular

compartment due to higher sodium concentration of blood leading to increased cardiac output.

Another important factor in this case is relatively sedentary lifestyle and excessive calorie intake which is one of the causes of hyperlipidaemia. According to Ayurveda, this is considered as reason for vitiation of the *Kapha* which is further associated with vitiation of *Sneha*, *Kleda* and *Meda Dhatu*. Vitiated *Sneha* especially *Rasa-Rakta* *Sneha* affects structure of vasculature in body by changing morphology of its walls. It further promotes accumulation of *Dushta meda* i.e., excessive lipids in blood vessels altering blood flow through the vessel. Such conditions broadly considered as arteriosclerotic changes are associated with increased peripheral resistance.

When arteriosclerotic changes effects end arteries like retinal arteries, distal areas mainly get affected, especially by deprivation of nutrients and oxygen. Such hypoxic areas release various chemicals consisting supra-oxide ions or reactive oxygen species (R.O.S.) as a response. These R.O.S. further damages vessel wall and promotes vascular dysfunction^[18] represented by exudates, haemorrhages, edema and neovascularization. These events compromising structural and functional integrity of vital organ vasculature, are known as T.O.D.^[19]. HR along with cystoid edema in macular region can be considered as T.O.D. here.

Samprapti-Bhanga

Drug used in this case *Vasakadi Kalpa* is mentioned by *Chakradatta*^[5] for its *Raktastravaghna* (anti-haemorrhagic), *Kaphaghna* (anti-inflammatory and anti-lipidemic) and *Chakshushya* nature. (improves vision mainly by reducing haemorrhages, exudates and retinal oedema) Ideal drug for treatment of hypertension and related changes should be *Vata Anulomana*, *Tridosahara*, *Ras-Rakta Prasadkara* and *Medohara*.^[20] *Vasakadi Kalpa* shows overall *Katu-Tikta pradhana Rasa*, *Katu Vipaka* and *Sheeta Virya*. Hence have the properties of *Ras-Rakta Prasadana* mainly acting on vitiated *Ras-Rakta* *Sneha*. It also shows *Tridosahara* nature due to its peculiar combination and *Vata Anulomaktva* of Some of its constituents like *Triphala* & *Patola*^[21] is well known.

As mentioned earlier these contents also shows Anti-oxidant nature.^[7-13] While, *Vasa*, *Bibhitaka* and *Musta* have anti-hypertensive properties.^[7,12,11] *Musta* also shows hypo-lipidemic and spasmolytic effects.^[11] Hence the *Kalpa*, as-a-whole lowers BP and helps in resolving T.O.D. caused by HTN like HR and CME.

CONCLUSION

Vasakadi Kalpa is having anti-haemorrhagic, hypo-lipidemic and anti-inflammatory nature. It also shows mild anti-hypertensive effect without any side effect. Even if, cystic retinal swelling has taken long

duration for resolution, it may be due to less bioavailability as only administrated orally in dosage 30ml BD. The drug may show much better activity if used in higher concentration and other routes providing higher bioavailability. Still, there is no doubt about visual improvement seen as a result of administration of *Vasakadi Kalpa*.

Abbreviations

- CME: Cystoid Macular Edema
- HR: Hypertensive Retinopathy
- HTN: Hypertension
- TOD: Target Organ Damage
- BP: Blood Pressure
- DOV: Dimness of Vision
- DM: Diabetes Mellitus
- BA: Bronchial Asthma
- I.O.: Indirect Ophthalmoscopy
- D.O.: Direct Ophthalmoscopy
- OCT: Optical Coherence Tomography

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